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INTRODUCTION.

This REVIEW for August, 1893, is based on reports from 3,087 regular and voluntary observers. These reports are classified as follows: 164 reports from Weather Bureau stations; 40 reports from United States Army post surgeons; 2,156 monthly reports from state weather service and voluntary observers; 32 reports from Canadian stations; 220 reports through the Southern Pacific Railway Company; 475 marine reports through the co-operation of the Hydrographic

Office, Navy Department; marine reports through the "New York Herald Weather Service"; monthly reports from local services established in all states and territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe.

CHARACTERISTICS OF THE WEATHER FOR AUGUST, 1893.

TEMPERATURE.

The month was warmer than normal in the middle Atlantic and New England states, the Lake region, and in Manitoba and Alberta; it was cooler than the average August along the middle Pacific coast and on the northeast slope of the Rocky Mountains. At Eastport, Me., and Manchester, N. H., the month was the warmest August on record, and at Keesees Ferry, Ark., Eureka Ranch, Kans., Grand Coteau, La., and Fort Reno, Okla., the coolest on record.

PRECIPITATION.

The rainfall was in excess over the greater part of the south Atlantic states. Although rainfalls of 20, 22, and 24 inches are reported from South Carolina, and although the average for that state is much in excess of the normal, yet the rainfall is not the largest on record, having been exceeded in 1885. The rainfall was deficient in the Mississippi and Ohio valleys and upper lake region.

LOCAL WIND STORMS.

The local storms of the month have been generally small and isolated, and of the character of gusts attending thunderstorms rather than tornadoes.

Hot winds, with temperatures of 104°, 108°, and 111°, have been reported from Montana.

HURRICANES.

Four hurricanes have approached the coast of the United States from the Atlantic Ocean, and after curving northeastward have continued on toward Europe.

The first of these appeared on the 15th at latitude 33° N.,

longitude 60° W.; passed north of the Bermudas; recurved at latitude 37° 5', and touched Newfoundland on the 18th.

The second passed near Saint Thomas and Puerto Rico on the 16th; recurved at latitude 32° 5', longitude 75°; touched Cape Hatteras and Cape Cod on the 21st.

The third was at latitude 22°, longitude 63°, on the 20th; recurved at latitude 35°, longitude 75°; passed near Cape Hatteras and Atlantic City and over New York City on the 24th; and thence to the mouth of the Saint Lawrence. Much destruction was done on the middle Atlantic coast.

The fourth was at latitude 23°, longitude 67°, on the 24th; recurved at latitude 35°, longitude 81°, in North Carolina, and passed over Newfoundland on the 30th. This storm did much destruction in the south Atlantic states. Its center passed over or near Jacksonville, Savannah, Charleston, Augusta, Charlotte, Lynchburg, Harrisburg, Ithaca, Oswego, Northfield, and Saint John, N. B. The destruction to property on shore may be estimated as approximately \$3,000,000. The loss of human life, nearly 2,000, was due principally to drowning by high water on the coast.

DROUGHT.

The injurious drought of July continued to the middle of August, and had generally lasted from eight to eleven weeks before it was broken by rains in the middle of August in the following states: Kentucky, Illinois, Indiana, Ohio, Michigan, and Missouri.

AURORAS.

During the night of the 6th auroral displays were noted generally over the northern and north-central parts of the country from New England to the north Pacific coast.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for August, 1893, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

Chart V exhibits the normal distribution of atmospheric pressure and normal wind movement by Lambert's formula over the United States for August, and has been prepared by Prof. H. A. Hazen, who has also prepared all the others of

this series, preliminary to the publication by the Weather Bureau of specially prepared data and charts showing the meteorological and climatic features and conditions of the United States. The pressures for the United States are reduced to sea-level by Prof. Hazen's methods and formulæ, those for Canada are reduced by Prof. Carpmael's method.

As compared with the preceding month of July, the mean pressures for August, 1893, are lower in the south Atlantic and Gulf states, but higher over New England and the Gulf of